

most all kinds of *Purples*, and many sorts of *Greens*, both these colours consisting of mixt colours; for if we suppose A and A in the ninth Figure, to represent two pulses of clear light, which follow each other at a convenient distance, A A, each of which has a *spurious* pulse preceding it, as B B, which makes a *Blue*, and another following it, as C C, which makes a *Red*, the one caus'd by tinging particles that have a greater refraction, the other by others that have a less refracting quality than the liquor or *Menstruum* in which these are dissolv'd, whatsoever liquor does so alter the refraction of the one, without altering that of the other part of the ting'd liquor, must needs very much alter the colour of the liquor; for if the refraction of the *dissolvent* be increas'd, and the refraction of the tinging particles not altered, then will the preceding *spurious* pulse be shortned or stop't, and not out-run the clear pulse so much; so that B B will become E E, and the *Blue* be *diluted*, whereas the other *spurious* pulse which follows will be made to lag much more, and be further behind A A than before, and C C will become f f, and so the *Yellow* or *Red* will be heightned.

A *Saline* liquor therefore, mixt with another ting'd liquor, may alter the colour of it several ways, either by altering the refraction of the liquor in which the colour swims: or secondly by varying the refraction of the coloured particles, by uniting more intimately either with some particular *corpuscles* of the tinging body, or with all of them, according as it has a *congruity* to some more especially, or to all alike: or thirdly, by uniting and interweaving it self with some other body that is already joyn'd with the tinging particles, with which substance it may have a *congruity*, though it have very little with the particles themselves: or fourthly, it may alter the colour of a ting'd liquor by dis-joyning certain particles which were before united with the tinging particles, which though they were somewhat *congruous* to these particles, have yet a greater *congruity* with the newly *infus'd Saline menstruum*. It may likewise alter the colour by further dissolving the tinging substance into smaller and smaller particles, and so *diluting* the colour; or by uniting several particles together as in precipitations, and so deepning it, and some such other ways, which many experiments and comparisons of differing trials together, might easily inform one of.

From these Principles applied, may be made out all the varieties of colours observable, either in liquors, or any other ting'd bodies, with great ease, and I hope intelligible enough, there being nothing in the *notion* of colour, or in the suppos'd production, but is very conceivable, and may be possible.

The greatest difficulty that I find against this *Hypothesis*, is, that there seem to be more distinct colours than two, that is, then *Yellow* and *Blue*. This Objection is grounded on this reason, that there are several *Reds*, which *diluted*, make not a *Saffron* or pale *Yellow*, and therefore *Red*, or *Scarlet* seems to be a third colour distinct from a deep degree of *Yellow*.

To which I answer, that *Saffron* affords us a deep *Scarlet* tincture, which may be *diluted* into as pale a *Yellow* as any, either by making a weak solution

lution of the *Saffron*, by infusing a small parcel of it into a great quantity of liquor, as in spirit of Wine, or else by looking through a very thin quantity of the tincture, and which may be heightn'd into the loveliest *Scarlet*, by looking through a very thick body of this tincture, or through a thinner parcel of it, which is highly *impregnated* with the tinging body, by having had a greater quantity of the *Saffron* dissolv'd in a smaller parcel of the liquor.

Now, though there may be some particles of other tinging bodies that give a lovely *Scarlet* also, which though *diluted* never so much with liquor, or looked on through never so thin a parcel of ting'd liquor, will not yet afford a pale *Yellow*, but only a kind of faint *Red*; yet this is no argument but that those ting'd particles may have in them the faintest degree of *Yellow*, though we may be unable to make them exhibit it; For that power of being *diluted* depending upon the divisibility of the ting'd body, if I am unable to make the tinging particles so thin as to exhibit that colour, it does not therefore follow, that the thing is impossible to be done; now, the tinging particles of some bodies are of such a nature, that unless there be found some way of comminuting them into less bulks than the liquor does dissolve them into, all the Rays that pass through them must necessarily receive a tincture so deep, as their appropriate refractions and bulks compar'd with the proprieties of the dissolving liquor must necessarily dispose them to empress, which may perhaps be a pretty deep *Yellow*, or pale *Red*.

And that this is not *gratis dictum*, I shall add one instance of this kind, wherein the thing is most manifest.

If you take *Blue Smalt*, you shall find, that to afford the deepest *Blue*, which *ceteris paribus* has the greatest particles or sands; and if you further divide, or grind those particles on a Grindstone, or *porphyry* stone, you may by *comminuting* the sands of it, *dilute* the *Blue* into as pale a one as you please, which you cannot do by laying the colour thin; for where-soever any single particle is, it exhibits as deep a *Blue* as the whole mass. Now, there are other *Blues*, which though never so much ground, will not be *diluted* by grinding, because consisting of very small particles, very deeply ting'd, they cannot by grinding be actually separated into smaller particles than the operation of the fire, or some other dissolving *menstruum*, has reduc'd them to already.

Thus all kind of *Metalline* colours, whether *precipitated*, *sublim'd*, *calcined*, or otherwise prepar'd, are hardly chang'd by grinding, as *ultra marine* is not more *diluted*; nor is *Vermilion* or *Red-lead* made of a more faint colour by grinding; for the smallest particles of these which I have view'd with my greatest Magnifying-Glass, if they be well enlightned, appear very deeply ting'd with their peculiar colours; nor, though I have magnified and enlightned the particles exceedingly, could I in many of them, perceive them to be transparent, or to be whole particles, but the smallest specks that I could find among well ground *Vermilion* and *Red-lead*, seem'd to be a *Red* mass, compounded of a multitude of less and less motes, which sticking together, compos'd a bulk, not one thousand thousandth part of the smallest visible sand or mote.

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